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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,931	05/15/2001	Soren Primdahl	11038/3	9855

13

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EXAMINER
CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 09/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,931	PRIMDAHL ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *11* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1, 2, and newly added claims 4-7. Claim 1 remains rejected for substantially the reasons of record, and claims 4 and 5 are newly rejected under 35 USC §103 as necessitated by amendment. However, claims 2, 6, and 7 are newly rejected under 35 USC §103, but this rejection was not necessitated by amendment. Accordingly, this action is non-final.

Information Disclosure Statement

2. The citation of JP 5-190183 on the IDS filed on June 30, 2003 (paper no. 11) has been crossed out because it is a duplicate citation, but the information contained in the translation has been considered.

Claim Objections

3. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 6 recites that Mn is present in the range of 1-6 metal atom %. However, parent claim 2 recites that the Mn is present in the range of 0.5-5 metal atom %. Thus, claim 6 fails to further limit the range specified in claim 2.

Claim Rejections - 35 USC § 102

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by JP 5-190183. The reference teaches a solid oxide fuel cell ("SOFC") in the abstract. In paragraph 9 of the machine translation, the reference discloses an Ni/YSZ electrode comprising Mn in a molar ratio of 5-50 mol% with respect to all the metallic elements in the electrode. This is considered to be anticipatory of the limitation that the added amount of Mn to a portion of the electrode extending less than 20 microns from the electrolyte interface is within the range of 0.5 to 5 metal atom % (i.e., the mol% range disclosed by the reference overlaps with the claimed metal atom% range, and the disclosure of Mn in the whole electrode anticipates the claimed range of less than 20 microns from the surface). Note: mole percent and metal atom percent are used interchangeably herein, since the reference identifies the mole percent as being with respect to "metallic elements."

Thus, the instant claim is anticipated.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 5-190183.

The reference is applied for the reasons stated in section 3 above.

While the reference teaches that the Mn content may be 5 metal atom %, the reference does not expressly teach that the Mn content is between 1-4 metal atom % (claim 4), or between 2-3 metal atom % (claim 5).

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of JP '183 to use a metal atom % of Mn within the ranges recited in instant claims 4 and 5 in the electrode of JP '183. In Figure 4, JP '183 shows a graph of polarization resistance as a function of Mn content. Selected values from 0 mol% to 60 mol% Mn are plotted. In paragraph 25, the reference states that electric charge resistance "especially" goes down when the Mn content is between 5-50%, and that 10-30% is "more desirable." However, while there are no values between 0% and 5% expressly plotted in Figure 4, the artisan would clearly see than an improvement in polarization resistance is attained within this range of Mn content. Using the 0% point as a baseline, an Mn content of 4% would cut the polarization resistance roughly in half (see line "A" in Fig. 4). Thus, while the range of 1%-4% does not appear to be a preferred embodiment of the JP '183 reference, an artisan would nevertheless be motivated to use an Mn content within this range since it results in a significant improvement in polarization resistance. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

7. Claims 1, 2, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruka et al (U.S. Patent 5,908,713) in view of JP 5-190183.

Regarding claims 1 and 2, Ruka et al. is directed to a solid oxide fuel cell comprising an Ni/YSZ fuel electrode (see abstract). The electrode preferably has a thickness of 100-150 microns (see col. 7, line 11).

Ruka et al. do not expressly teach that manganese is present in the fuel electrode, as recited in claims 1 and 2.

As set forth above, JP 5-190183 is directed to a fuel electrode comprising 5-50 metal atom % Mn.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of JP '183 to add 5-50 metal atom % Mn to the fuel electrode of Ruka et al. In paragraph 10 of the machine translation, JP '183 teaches that "[a]s for this inventor, when manganese it exists in portion of three-phase interface which consists of fuel electrode and solid electrolyte and gas phase, activated polarization of fuel electrode small becomes considerable, output of SOFC unit battery improves to discover, this invention was completed. Furthermore, according to this invention, because high melting point metal like ruthenium is not used, it is not necessary to use trace metal of high cost which can produce fuel electrode with conventional method and, such as ruthenium, praseodymium." Accordingly, the artisan would be motivated to use 5-50 metal atom % Mn in the fuel electrode of Ruka et al. Thus, the ranges recited in the instant claims would be rendered obvious since the Mn would be present in an amount of 5 metal atom% in the whole electrode of Ruka et al., i.e., in a position closer than 20 microns from the

electrode/electrolyte surface (claim 1) and in a position further than 20 microns therefrom (claims 2, 6, and 7).

Response to Arguments

8. Applicant's arguments filed June 27, 2003 have been fully considered but they are not persuasive insofar as they are applicable to the §102 rejection of claim 1. Applicants assert that "there is no suggestion within the '183 patent for an electrode having a particular manganese concentration that is spatially related to the distance from the electrolyte." However, in the case of claim 1, the distance of "less than 20 μm from the electrolyte" is inherent in the reference. As noted above, if the entire electrode of JP '183 contains Mn in an amount of 5 metal atom %, then the portion of the electrode less than 20 μm from the electrolyte would have to contain this same amount of Mn. Accordingly, the distance limitation recited in claim 1 is inherently met by the reference.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally,

documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

August 27, 2003

JONATHAN CREPEAN
PATENT EXAMINER
ART UNIT 1746